

WHAT IS CLAIMED IS:

1. A supporting system, comprising:
a carrying member for carrying thereon a
workpiece; and
5 a supporting mechanism having a magnet, for
supporting a weight of said carrying member;
wherein a supporting force to be provided by
said magnet does not change with a shift of said
carrying member along a plane perpendicular to a
10 direction in which the weight is supported.
2. A supporting system according to Claim 1,
wherein said supporting mechanism has a magnet and a
magnetic member, and wherein said magnet and said
15 magnetic member differ from each other in respect to a
size in a direction perpendicular to a direction in
which a force operates between said magnet and said
magnetic member.
- 20 3. A supporting system according to Claim 1,
wherein said supporting mechanism includes plural
magnets for mutually operating a force, wherein one
magnet differs from another magnet in respect to a
size in a direction perpendicular to a direction in
25 which a force operates between the magnets.
4. A supporting system according to Claim 1,

wherein said supporting mechanism includes a magnetic member and an electromagnet, wherein said magnetic member and said electromagnet differ from each other in respect to a size in a direction perpendicular to a direction in which a force operates between said magnetic member and said electromagnet.

5 5. A supporting system according to Claim 4,
wherein each of said magnetic member and said
10 electromagnet comprises a layered structure of thin
magnetic material plates.

6. A supporting system according to Claim 4,
further comprising a controller for controlling an
15 electric current to said electromagnet.

7. A supporting system according to Claim 6,
further comprising a detector for detecting a
clearance between said electromagnet and said magnetic
20 member, and a circuit for feedback of a signal related
to the detected clearance to an electric current to be
applied to said electromagnet.

8. A supporting system according to Claim 1,
25 further comprising a position controller for
positioning said carrying member, wherein plural
supporting mechanism are disposed so as not to produce

a moment to said position controller.

9. A supporting system, comprising:

a carrying member for carrying thereon a
5 workpiece; and

a supporting mechanism for supporting said
carrying member, said supporting mechanism having a
first element for producing a resisting force to a
shift in a supporting direction, and a second element
10 for producing a force for increasing the shift in the
supporting direction;

wherein said second element can produce a
force for moving said carrying member downwardly.

15 10. A supporting system according to Claim 9,
wherein said supporting mechanism includes a spring
element and a magnet element.

11. A supporting system according to Claim 10,
20 wherein, adjacent a workpiece processing position for
the workpiece, a weight of said carrying member and a
combined force of said first and second elements are
substantially equal to each other.

25 12. A supporting system, comprising:

a carrying member for carrying a workpiece
thereon; and

a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position, said supporting mechanism having a first element for producing a
5 resisting force to a shift in a supporting direction, and a second element for producing a force to increase a shift in the supporting direction.

13. A supporting system according to Claim 12,
10 wherein said second element for producing a force to increase the shift produces a force to move said carrying member downwardly.

14. A supporting system according to Claim 12,
15 wherein, adjacent to the workpiece processing position, the weight of said carrying member and a combined force of said first and second elements are approximately equal to each other.

20 15. A supporting system according to Claim 12, wherein the force to be produced by said second element is larger at the transfer position than at the workpiece processing position.

25 16. A supporting system according to Claim 12, wherein said first and second elements include a spring element and a magnet element.

17. A supporting system, comprising:

a carrying member for carrying a workpiece thereon; and

5 a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position, said supporting mechanism having a spring element and a magnet element;

10 wherein, adjacent the workpiece processing position, the weight of said carrying member and a combined force of said spring element and said magnet element are approximately equal to each other, and wherein said magnet element has a magnet with a
15 clearance which is smaller at the transfer position than at the workpiece processing position.

18. A supporting system according to Claim 17, wherein, at a certain position, the clearance of the
20 magnet of said magnet element is smaller than that at the workpiece processing position, and at that position, the weight of said carrying member and the combined force of said spring element and said magnet element are approximately equal to each other.

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19. A supporting system according to Claim 17, wherein an absolute value of a changing rate of the

force of said magnet element with respect to a change
in clearance of the magnet, adjacent the workpiece
processing position, is set smaller than an absolute
value of a changing rate of the force of said spring
5 element with respect to a change in the clearance of
the magnet.

20. A supporting system, comprising:
a carrying member for carrying a workpiece
10 thereon; and
a supporting mechanism for supporting said
carrying member from a workpiece transfer position to
a workpiece processing position, said supporting
mechanism having a spring element and a magnet
15 element;
wherein, adjacent the workpiece processing
position, the weight of said carrying member and a
combined force of said spring element and said magnet
element are approximately equal to each other, and
20 wherein said magnet element has a magnet with a
clearance which is larger at the transfer position
than at the workpiece processing position.

21. A supporting system according to Claim 20,
25 wherein, at a certain position, the clearance of the
magnet of said magnet element is larger than that at
the workpiece processing position, and at that

position, the weight of said carrying member and the combined force of said spring element and said magnet element are approximately equal to each other.

5 22. A supporting system according to Claim 20,
wherein an absolute value of a changing rate of the
force of said magnet element with respect to a change
in clearance of the magnet, adjacent the workpiece
processing position, is set larger than an absolute
10 value of a changing rate of the force of said spring
element with respect to a change in the clearance of
the magnet.

 23. A supporting system, comprising:
15 a carrying member for carrying a workpiece
thereon; and
 a supporting mechanism for supporting said
carrying member from a workpiece transfer position to
a workpiece processing position, said supporting
20 mechanism having a spring element and a magnet
element;

 wherein an absolute value of a changing rate
of the force of said magnet element with respect to a
change in clearance of the magnet, adjacent the
25 workpiece processing position, is set smaller than an
absolute value of a changing rate of the force of said
spring element with respect to a change in the

clearance of the magnet.

24. A supporting system, comprising:

5 a carrying member for carrying a workpiece
thereon; and

a supporting mechanism for supporting said
carrying member from a workpiece transfer position to
a workpiece processing position, said supporting
mechanism having a spring element and a magnet
10 element;

wherein an absolute value of a changing rate
of the force of said magnet element with respect to a
change in clearance of the magnet, adjacent the
workpiece processing position, is set larger than an
15 absolute value of a changing rate of the force of said
spring element with respect to a change in the
clearance of the magnet.

25. A supporting system, comprising:

20 a carrying member for carrying a workpiece
thereon; and

a supporting mechanism for supporting said
carrying member from a workpiece transfer position to
a workpiece processing position;

25 wherein, adjacent the transfer position, the
weight of said carrying member and a force to be
applied to said carrying member are substantially

balanced, and wherein, adjacent the workpiece
processing position, the weight of said carrying
member and a force to be applied to said carrying
member are substantially balanced.

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26. A supporting system according to Claim 25,
wherein said supporting mechanism has a first element
for producing a resisting force to a shift in a
supporting direction, and a second element for
10 producing a force for increasing the shift in the
supporting direction.

27. A supporting mechanism according to Claim 25,
wherein said supporting mechanism includes a spring
15 element and a magnet element.

28. An exposure apparatus, comprising:
a carrying member for carrying thereon a
workpiece; and
20 a supporting mechanism having a magnet, for
supporting a weight of said carrying member;
wherein a force to be applied to said magnet
does not change with a shift of said carrying member
along a plane perpendicular to a direction in which
25 the weight is supported.

29. An exposure apparatus, comprising:

a carrying member for carrying thereon a workpiece; and

5 a supporting mechanism for supporting said carrying member, said supporting mechanism having an element for producing a force to increase/decrease a shift in a supporting direction, wherein, as the shift in the supporting direction increases, said carrying member is moved downwardly.

10 30. An exposure apparatus, comprising:

a carrying member for carrying a workpiece thereon; and

15 a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position, said supporting mechanism having a first element for producing a resisting force to a shift in a supporting direction, and a second element for producing a force to increase a shift in the supporting direction.

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31. An exposure apparatus, comprising:

a carrying member for carrying a workpiece thereon; and

25 a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position, said supporting mechanism having a spring element and a magnet

element;

wherein, adjacent the workpiece processing position, the weight of said carrying member and a combined force of said spring element and said magnet element are approximately equal to each other, and wherein said magnet element has a magnet with a clearance which is smaller at the transfer position than at the workpiece processing position.

10 32. An exposure apparatus, comprising:

a carrying member for carrying a workpiece thereon; and

a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position, said supporting mechanism having a spring element and a magnet element;

wherein, adjacent the workpiece processing position, the weight of said carrying member and a combined force of said spring element and said magnet element are approximately equal to each other, and wherein said magnet element has a magnet with a clearance which is larger at the transfer position than at the workpiece processing position.

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33. An exposure apparatus, comprising:

a carrying member for carrying a workpiece

thereon; and

a supporting mechanism for supporting said
carrying member from a workpiece transfer position to
a workpiece processing position, said supporting
5 mechanism having a spring element and a magnet
element;

wherein an absolute value of a changing rate
of the force of said magnet element with respect to a
change in clearance of the magnet, adjacent the
10 workpiece processing position, is set smaller than an
absolute value of a changing rate of the force of said
spring element with respect to a change in the
clearance of the magnet.

15 34. An exposure apparatus, comprising:

a carrying member for carrying a workpiece
thereon; and

a supporting mechanism for supporting said
carrying member from a workpiece transfer position to
20 a workpiece processing position, said supporting
mechanism having a spring element and a magnet
element;

wherein an absolute value of a changing rate
of the force of said magnet element with respect to a
25 change in clearance of the magnet, adjacent the
workpiece processing position, is set larger than an
absolute value of a changing rate of the force of said

spring element with respect to a change in the clearance of the magnet.

35. An exposure apparatus, comprising:

5 a carrying member for carrying a workpiece thereon; and

 a supporting mechanism for supporting said carrying member from a workpiece transfer position to a workpiece processing position;

10 wherein, adjacent the transfer position, the weight of said carrying member and a force to be applied to said carrying member are substantially balanced, and wherein, adjacent the workpiece processing position, the weight of said carrying member and a force to be applied to said carrying member are substantially balanced.

36. A device manufacturing method, comprising the steps of:

20 preparing an exposure apparatus as recited in any one of Claims 28 - 35;

 applying a resist to a wafer;

 exposing the wafer by use of the exposure apparatus; and

25 developing the exposed wafer.